

Remarks

Applicants respectfully request reconsideration of the above-identified application in view of the present amendment and the following remarks.

Claims 1-24 were pending. By this paper, Applicant has cancelled claims 19 and 22, amended claims 1, 3-4, 14-18, 20-21 and 23-24, and added new claims 25-30. The present Amendment also amends the "CROSS-REFERENCE TO RELATED APPLICATIONS" section of the application to fix an apparent typographical error. No new matter has been introduced by virtue of the present Amendment. After entry of this Amendment, claims 1-18, 20-21, and 23-30 will be pending.

Applicants note, with appreciation, the indication of allowability of claims 7-10 and 16-24.

Claims 1-24 were rejected under 35 U.S.C. § 112, second paragraph. Claim 1 has been amended to overcome the 35 U.S.C. § 112, second rejection. Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. § 112, second paragraph rejection.

Claims 1-2, 5-6 and 11-14 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,257,309 to Kinane et al., hereinafter "*Kinane I*", in view of U.S. Patent No. 5,947,179 to Kinane et al., hereinafter "*Kinane II*". Applicants respectfully traverse the present rejection.

The present invention relates to methods and arrangements for manufacturing spray formed metallic articles that utilize heat treatment processes for minimizing internal stresses and deflections in the resulting articles. As set forth in the background art of the application, temperature control has been used in the past in an attempt to control distortion of the spray formed article. The present invention provides a more controlled approach relative to the prior art for controlling distortion. The present invention strives to achieve a

strategic formation of intermixed metal phases to avoid and minimize the incurement of stress and strain in the finished article. The intermixed phases create zones in the article that are softer and more malleable than other zones in the article which allows for plastic deformation in the article to help prevent cracking or other structural failure as a result of cooling of the metal.

To practice the present invention, claim 1 recites a method for implementing pre-heat treatment before spray forming begins to achieve stress control in the manufacture of a spray formed metallic article. The method comprises preheating at least one of a spray forming cell environment and a mold substrate disposed within the spray forming cell environment to a preselected initial temperature initiating application of a metallic spray forming material at a preselected initial application temperature of the spray-forming material upon the mold substrate in the manufacture of a spray formed article, and causing preselected substantially homogenous initial metallic phase transformations of the spray forming material from an austenite phase of the spray forming material to a substantially homogenous initial distribution of commingled metallic phases consisting of a predetermined proportion of at least one of a bainite phase and a martensite phase of the spray forming material and a predetermined proportion of the austenite phase of the spray forming material. The substantially homogenous initial metallic phase transformations are caused at least in part via a predetermined relationship between the initial application temperature of the spray-forming material and the initial temperature of the at least one of the preheated cell environment and the preheated mold substrate.

To begin with, *Kinane I* is not a proper 103(a) reference. *Kinane I* and the present invention were, at the time the present invention was made, were owned by, or subject to an obligation of Assignment, to the same entity. *Kinane I* only qualifies as prior art against the present invention as 102(e) application. *Kinane I* of the present application were both assigned to, or subject to an obligation of assignment to, Ford Motor Company at the time the present invention was made. Accordingly, *Kinane I* is not a proper 103 reference and as such,

it is respectfully requested that the 35 U.S.C. §103 rejection based upon *Kinane I* be withdrawn.

Furthermore, *assuming arguendo* that *Kinane I* could qualify as § 103 prior art against the present invention, the resulting combination of *Kinane I* and *Kinane II* is still improper.

It has not been established that the present invention would have been obvious at the time it was made. For the combination of *Kinane I* with *Kinane II* to be proper, the suggestion to combine the references must be present in the prior art. There is no suggestion whatsoever in the prior art to combine these references. Furthermore, even if the references were combinable, the combined references do not disclose, teach or suggest the claimed the invention.

The Examiner's assertion that it would have been obvious to combine *Kinane I* with *Kinane II* appears to be nothing more than an unsupported conclusion. No evidence of a suggestion to combine has been shown. The law requires that there must be some teaching, suggestion or motivation to combine the two references. Absent such evidence, the combination is improper.

The requirement to show evidence of a suggestion to combine is necessary to prevent the accidental use of hindsight to reject an invention. Identify prior art corollaries for the claimed invention is wholly improper. As set forth in *In re Rouffet*, identifying claimed elements in the prior art without providing any evidence to suggest their combination is improper.

If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements, would permit an Examiner to use the claimed invention as a blueprint for piecing together elements in the prior art to defeat the patentability of

the claimed invention. Such an approach would be “an illogical and inappropriate process by which to determine patentability.”

(*In re Rouffet*, 47 USPQ 2d, 1457, quoting *Sensonics, Inc. v. Aerosonic Corp.*, 38 USPQ 2d, 1551, 1554 (Fed. Cir. 1996) (Emphasis added.)¹

Motivation to combine reference does not exist in the prior art.

The focus of *Kinane I* is to form easily weldable or machinable spray formed articles. To do this, *Kinane I* utilizes metallic particles having a carbon content of less than 0.3 wt. %. When spraying carbon steel having a carbon content of less than 0.3 wt. %, *Kinane I* discloses that the ceramic spray formed pattern must be heated to a sustained temperature of above 500°C. *Kinane I* deals with spraying only a very specific material. Furthermore, as correctly noted in the Office Action, *Kinane I* makes no mention of the use of a preselected initial application temperature.

In order to overcome this deficiency, the Examiner combines *Kinane II* with *Kinane I*. The focus of *Kinane II* is to abate or prevent the formation of distortion promoting stresses in bulk sprayed objects without the need for rapid cooling. To achieve this objective, *Kinane II* discloses spraying the particles at a temperature sufficiently high that impact the temperature of the particles is about 700 to 850°C to create a coarse bainite structure which will help to relieve internal stresses in the spray formed article. Thus, while *Kinane I* teaches employing the use of elevated temperatures of the spray forming pattern for its spraying process, *Kinane II* discloses employing the use of elevated spraying temperatures for its spraying process. Thus, *Kinane I* and *Kinane II* teach differing spraying procedures having opposite approaches. Applicants fail to see how either reference would suggest its combination with the other reference since each disclose entirely different spraying procedures.

¹ Copies of all cases cited herein are included herewith for the Examiner's convenience.

Since no motivation to combine the references has been offered, Applicant respectfully submits that the rejection is improper.

Furthermore, assuming arguendo that *Kinane I* and *Kinane II* were properly combinable, as the Examiner posists, the resulting combinations does not teach, disclose or suggest the present invention.

The present invention recites causing preselected substantially homogeneous initial metallic phase transformations of the spray forming material from an austenite phase...to a substantially homogeneous initial distribution of commingled metallic phases consisting of a predetermined portion of at least one of a bainite phase and a martensite phase...and a predetermined proportion of the austenite phase.... Nowhere in either one of the *Kinane* references is this step disclosed, taught or suggested. There is no mention in either *Kinane* reference of commingled metallic phases consisting of a bainite or martensite phase with austenite phase. It is this predetermined commingling of phases that helps to achieve the desired stress control.

Furthermore, claim 1 recites that the substantially homogeneous initial metallic phase transformations are caused at least in part via a predetermined relationship between the initial application temperature of the spray forming material and the initial temperature. Even combining *Kinane I* with *Kinane II*, the step of causing transformations at least in part via a predetermined relationship does not exist. The act of combining selected portions of *Kinane I* with selected portions of *Kinane II* precludes the existence of any predetermined relationship since there is no cooperation of process between the two references. Accordingly, Applicants respectfully submit that the rejection of claim 1 in view of the combination of *Kinane I* and *Kinane II* is improper.

Accordingly, claim 1 is patentable.

Claims 2-15 all depend either directly or indirectly from claim 1 and are therefore patentable for at least the same reasons as claim 1. Moreover, these claims add further limitations which render them separately patentable.

Claims 3-4 and 15 were rejected under 35 U.S.C. § 103 as being unpatentable over *Kinane I* in view of *Kinane II* and further in view of U.S. Patent No. 5,952,052 to Jordan et al., hereinafter “*Jordan*”. There is nothing in *Jordan* that cures the defects of the improper combination of *Kinane I* with *Kinane II*. Accordingly, the rejection of these claims over *Kinane I* in view of *Kinane II* and further in view of *Jordan* is improper for at least the same reasons as the rejection of claim 1 is improper. Furthermore, *Jordan* only teaches a certain preheating temperature of the substrate. As with the rejection of claim 1, the Examiner appears to be picking and choosing selected portions of Applicants invention from the prior art. This is improper. Accordingly, Applicant respectfully requests of the 35 U.S.C. § 103 rejection of claims 3-4 and 15.

As discussed above, claims 7-10 and 16-24 were indicated as being allowable if rewritten to overcome the rejections under 35 U.S.C. § 112, second paragraph. Applicants have not chosen to rewrite all of these claims at the present time as Applicants feel that the rejection of claim 1 is improper for the reasons stated above.

Claim 25 recites a method for implementing pre-heat treatment before spray forming begins to achieve stress control in the manufacture of a spray formed metallic article. The method comprises preheating a spray forming cell environment to a preselected initial temperature, initiating application of a metallic spray forming material at a preselected initial application temperature of the spray-forming material upon the mold substrate in the manufacture of a spray formed article, causing preselected substantially homogenous initial metallic phase transformations of the spray forming material from an austenite phase of the spray forming material to a substantially homogenous initial distribution of commingled metallic phases consisting of a predetermined proportion of at least one of a bainite phase and a martensite phase of the spray forming material and a predetermined proportion of the

austenite phase of the spray forming material, and controlling the cooling of the spray-forming material. The substantially homogenous initial metallic phase transformations are caused at least in part via a predetermined relationship between the initial application temperature of the spray-forming material and the initial temperature of the preheated cell environment.

Claim 25 is allowable for essentially the same reasons as claim 1. Furthermore, claim 25 adds the limitation of controlled cooling, which is not discussed in the prior art.

Claim 26 depends from claim 25 and is therefore allowable for the same reason as claim 25. Moreover, this claim adds further features which renders it separately allowable.

Claim 27 is essentially similar to claim 9, absent some limitations for intervening claims not deemed necessary, rewritten in independent form. Claim 9 was given an indication of allowability. Accordingly, claim 27 is allowable.

Claims 28 depends from claim 27 and is therefore allowable for at least the same reasons as claim 27. Moreover, this claim adds further features which renders it separately allowable.

Claim 29 is claim 19 rewritten in independent form. Claim 19 was given an indication of allowability. Accordingly, claim 29 is allowable.

Claim 30 is claim 22 rewritten in independent form. Claim 22 was given an indication of allowability. Accordingly, claim 30 is allowable.

Applicants submit that the claims are in a condition for allowance and respectfully request a notice to that effect. If the Examiner believes that a telephone conference will advance the prosecution of this application, such a conference is invited at the convenience of the Examiner.

The Commissioner is hereby authorized to charge the \$172.00 additional claim fee and any fee deficiency associated with the filing of this Paper to the Deposit Account of Applicants' assignee, Ford Global Technologies LLC, Deposit Account No. 06-1510 -- a duplicate of the Amendment Transmittal paper is enclosed for that purpose.

Respectfully submitted,

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